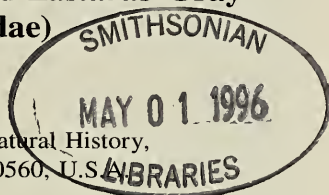


**New species of mammals from northern South America:
Bats of the genera *Histiotus* Gervais and *Lasiurus* Gray
(Chiroptera: Vespertilionidae)**

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Abstract.—Two strikingly differentiated species of northern South American *Histiotus* and *Lasiurus* have been long known, but until now have remained undescribed and unnamed. The new *Histiotus* (*H. humboldti*) is a relict species, most like *H. montanus* Philippi & Landbeck, but differing from it and all other *Histiotus* in small size (forearm <47 mm, maxillary tooththrow length <5.7 mm), fragile skull, and weak dentition. Isolated populations occur at medium elevations (1500–2200 m) in the Coast Range, in the Mérida Andes, and on Cerro Neblina in Venezuela, and in the Central and Western Andes and upper Cauca Valley in Colombia. The new *Lasiurus* (*L. atratus*) is a Guayanian endemic known from Venezuela, Suriname, and French Guiana. Medium size (forearm 44–47 mm, max. tooththrow l. 4.4–5.0 mm) and black wings relate it to *L. varius* Poeppig of Chile and *L. castaneus* Handley of Panamá and Costa Rica; but very bright black and white underparts; small antorbital fossa; obsolete lachrymal process, supraorbital ridge, and basal pits; and well-developed mastoid process distinguish it from both.

Mammals and their ectoparasites were collected in Venezuela between 1965 and 1968 by the Smithsonian Venezuelan Project, supported in part by a contract (DA-49-MD-2788) of the Medical Research and Development Command, Office of the Surgeon General, U.S. Army. Numerous papers have described the ectoparasites and mammals of the Project. Throughout these papers undescribed species of mammals have been referred to by alphabetical designations. Some of these have been named subsequently by Handley & Ferris (1972), Handley & Gordon (1980), Handley (1984, 1987). This paper provides formal descriptions for insect-eating bats of the genera *Histiotus* Gervais and *Lasiurus* Gray.

Material and Methods

Measurements.—All measurements used in this paper are in millimeters and follow

the directions of Kalko & Handley (1994). Cranial measurements were taken with the assistance of a binocular microscope, with dial calipers reading to 0.1 mm.

Specimens are deposited in the following institutions: American Museum of Natural History, New York (AMNH); Estación Biológica de Rancho Grande, Maracay (EBRG); Field Museum of Natural History, Chicago (FMNH); National Museum of Natural History, Washington (USNM); Universidad Central de Venezuela, Caracas (UCV).

Systematics

A new species of Leaf-eared bat,
genus *Histiotus* Gervais

One of the first bats netted by the Smithsonian Venezuelan Project at its inception in July 1965, at Los Venados in the Coast Range overlooking Caracas, was a species

of *Histiotus*. This genus had not been found previously in Venezuela. In a few weeks we caught three more *Histiotus* at Los Venados and at the Hotel Humboldt higher up on the mountain. These represented a new species that I describe and name here.

This species has been mentioned in the literature as *Histiotus montanus colombiae* Thomas by Tamsitt & Valdivieso (1966) from Cauca, Colombia, and as *Histiotus* sp. A by me (Handley 1976) from Distrito Federal, Venezuela, and by Gardner (1990) from Cerro Neblina, Venezuela.

Histiotus humboldti, new species
(Fig. 1, Table 1)

Synonymy.—

Histiotus montanus colombiae Tamsitt & Valdivieso, 1966:102 (not *Histiotus colombiae* Thomas, 1916).

Holotype.—USNM 370968, adult female (lactating); skin, skull, and skeleton; collected 24 July 1965 by Charles O. Handley, Jr. Original number, SVP 00092.

Type locality.—Los Venados, 4 km NNW Caracas, 10°32'N, 66°54'W, 1498 m, Distrito Federal, Venezuela. The holotype was caught 150 m west of park headquarters buildings in a mist net set across a Jeep trail in second-growth forest with thick underbrush. This area is classified as LOWER MONTANE humid forest (bh-MB) in the Holdridge system (Ewel and Madriz 1968).

Etymology.—This impressive bat is named in honor of the great naturalist Alexander von Humboldt who traveled widely in Venezuela in 1799 and 1800 and described many Venezuelan mammals (Hershkovitz 1987).

Distribution.—*Histiotus humboldti* has a fragmented range, with apparently isolated populations in southwestern Colombia (on the lower eastern flanks of the Western Andes at El Tambo and Quisquio and near the head of the Cauca Valley at Popayán), in north-central Colombia in the northern part of the Central Andes (La Ceja and Poblado), in the Mérida Andes in western Ven-

ezeuela (near San Juan de Lagunillas), in the Coast Range in northern Venezuela (Los Venados and Pico Avila), and on Cerro Neblina in southern Venezuela. Elevational range, from 1498 m at Los Venados to 2217 m at La Ceja.

Ecology.—*Histiotus humboldti* is a montane species that occurs at medium elevations, lower than *H. montanus* usually is found at this latitude. Specimens from the Coast Range in northern Venezuela were taken in moist, second-growth, evergreen forest; fairly tall at Los Venados, low and very dense at Hotel Humboldt on Pico Avila. Three were taken in forest trails and one was netted in a livestock pen where trees remained, but underbrush had been cleared (Handley 1976). On Cerro Neblina *H. humboldti* was taken in scrubby tepuyan vegetation in open areas close to rocky sand hills (A. L. Gardner, pers. comm.).

Diagnosis.—*Histiotus humboldti* can be recognized as a *Histiotus* by its enormous ears, plain (unornamented) snout, *Eptesicus*-like skull, and vespertilionid dentition. It can be distinguished from other *Histiotus* by its small size, delicate rostrum, fragile zygomata, inflated braincase, and small, weak dentition.

Description.—Dorsal coloration bright tan to brown, darker where blackish hair bases show through; underparts buff with fuscous hair bases showing through. Ears very large (28–32); anterior lobe wide (4.3–5.5) and forming a point where it folds; tragus relatively short and broad (9–11 × 3.5–4.0); tibia and fingers relatively short (tib. 17.5–18.8, F2 39.1–40.6, F3 78.3–80.5, F4 62.6–65.6, F5 56.2–60.0). Skull (Fig. 1) fragile throughout; rostrum short (max. toothrow l. 5.3–5.6), narrow (max. br. 5.9–6.1), and shallow; facial profile sharply dishd; lachrymal ridge strongly developed; supraorbital region bulges, but is not ledged; braincase and area of postorbital constriction notably inflated; zygoma fragile, but with a large postorbital process; pterygoid processes thin and delicate. Teeth small and



Fig. 1. Dorsal, ventral, and lateral views of the skull and lateral view of the mandible of *Histiotes humboldti*, USNM 560627, male, from Cerro Neblina, Amazonas, Venezuela. A. L. Gardner photograph. Scale 7:1.

Table 1.—Measurements (in millimeters) and mass (in grams) of adult *Histiotus humboldti*.

	USNM 370968* Los Venados Venezuela ♀	UCV J-03208 Cerro Neblina Venezuela ♀	FMNH 72340 La Ceja Colombia ♀	EBRG [US370967] Los Venados Venezuela ♂	USNM 370969 Pico Avila Venezuela ♂	USNM 370970 Pico Avila Venezuela ♂	USNM 560627 Cerro Neblina Venezuela ♂	FMNH 86719 Popoyán Colombia ♂
Total length	109	107	—	106	110	110	110	—
Tail vertebrae	50	50	—	52	48	47	51	—
Hind foot (dry)	9	11	10	9	10	9	11	11
Ear from notch	30	28	—	32	30	31	29	—
Forearm	45.7	46.8	46.8	45.5	45.7	45.5	46.9	46.0
Tibia	17.5	18.0	18.0	17.5	18.3	17.9	18.8	18.6
Calcar	26.3	23.0	—	26.1	22.8	—	23.8	—
Mass	—	11.5	—	—	—	—	9.5	—
Greatest length	16.4	16.5	—	16.0	16.3	16.4	16.9	—
Zygomatic breadth	9.6	9.8	—	9.2	9.5	9.5	9.4	—
Postorbital breadth	4.7	4.5	—	4.5	4.4	4.5	4.5	—
Braincase breadth	8.1	8.0	—	7.8	8.3	7.9	8.0	—
Braincase depth	5.8	5.8	—	5.6	5.6	5.8	6.2	—
Maxillary toothrow length	5.4	5.5	5.4	5.5	5.3	5.5	5.6	5.4
Postpalatal length	6.5	6.1	—	6.3	6.4	6.6	6.6	—
Maxillary breadth	6.0	6.0	5.9	6.0	5.9	6.1	6.0	6.1
Canine breadth	4.2	4.2	4.1	4.2	4.1	4.1	4.3	4.2

* Holotype.

weak, with low cusps; dental formula $2/3-1/1-1/2-3/3 \times 2 = 32$.

Comparisons.—*Histiotus humboldti* differs in almost every detail from *H. macrotis* Poeppig and *H. velatus* I. Geoffroy. It most resembles *H. montanus colombiae*, a taxon with which it is sympatric in some areas, but these species differ in many details. Coloration, both dorsally and ventrally, is similar in both species. Ears of *H. humboldti* are proportionally about the same size as those of *H. m. colombiae*, but the anterior lobe is wider and is more pointed than in any *H. montanus* (not as extreme as in *H. velatus*, however). The tragus is shorter and broader than in any other *Histiotus*. The tibia is shorter than in any *H. montanus* and finger proportions resemble *H. velatus* more than they do *H. m. colombiae*. In fact, in all finger measurements, *H. humboldti* is smaller or averages smaller than *H. m. colombiae*.

Skulls of *Histiotus montanus* and *H. macrotus* are similar to one another and quite different from *H. velatus*, but the skull of *H. humboldti* is so distinctive, that com-

pared with it, the skulls of the other three species are relatively similar to one another. In that comparison the skull of *H. humboldti* looks as though it might even represent a different genus. In fact it bears a strong superficial resemblance to skulls of North American *Plecotus* E. Geoffroy, *Idionycteris* Anthony, and *Euderma* H. Allen. Compared with the other species of *Histiotus*, the skull of *H. humboldti* is more delicate throughout; braincase and postorbital are much more inflated; rostrum is much shallower and narrower; dishing of facial profile is much more pronounced; lachrymal ridge is more developed, but the supraorbital ledge is undeveloped; zygomata are less flaring and much more fragile; pterygoid processes are more fragile; teeth are relatively tiny, very weak, and have lower cusps. Its relatively delicate skull and weak dentition indicate that *Histiotus humboldti* must have a softer diet than the other species of *Histiotus*.

Remarks.—Linares (1973) reported a specimen of *Histiotus* in the Muséum National d'Histoire Naturelle, Paris (MNHN),

collected in 1894 by Briceño Gabaldon, near Mérida, Venezuela. Linares regarded the specimen as quite different from Colombian and Ecuadorean *H. montanus* because it had smaller canines and upper premolars, an enlarged postorbital process on the zygoma, and a dished facial profile. He thought some features of the specimen were reminiscent of *H. velatus*. However, because of scant material and inadequate knowledge of variation in *Histiotus*, he tentatively identified the specimen as *H. m. colombiae* (not typical).

Some characters that Linares ascribed to the Mérida specimen are characteristic of *Histiotus humboldti*. However, the suite of measurements of the Mérida specimen place it within the size range of *H. m. colombiae*, and show that it is apparently too large to be *H. humboldti*. I conclude that Linares was correct in identifying the Venezuelan specimen in MNHN as *H. montanus*.

Recently Jesús Molinari (pers. comm.) has taken *Histiotus humboldti* (confirmed by measurements and photographs of the skull) adjacent to an extensive island of xeric vegetation at Tierra Negra, 1550 m, ca. 12 km S San Juan de Lagunillas, Estado Mérida, Venezuela. Thus, in Venezuela, *Histiotus montanus* is known in the Mérida Andes, while *H. humboldti* appears to have a fragmented distribution at medium elevations in the Coast Range, in the Mérida Andes, and on a Guayanan tepui, peripheral to the range of *H. montanus*. A similar relationship is observed in Colombia. This suggests to me that *H. humboldti* once had a more extensive, continuous range in the mountains of northern South America that has been overrun and fragmented by *H. montanus*.

Specimens examined.—Colombia: Antioquia: La Ceja, [ca. 2217 m], 2 alc. (FMNH); Poblado, [ca. 1600 m], 1 alc. (AMNH). Cauca: Popayán, 1750 m, 1 alc. (FMNH). Venezuela: Amazonas: Cerro Neblina, Camp II, 2.8 km NE Pico Phelps, 1820 m, 1 skin & skull (USNM), 1 skin &

skull (UCV). Distrito Federal: Los Venados, 4 km NNW Caracas, 1498 m, 2 skin, skull & skeleton (USNM); Pico Avila, 5 km NNE Caracas, 2092–2101 m, 1 skin, skull & skeleton (USMN), 1 skin & skull (EBRG).

References to other specimens.—Colombia: Cauca: El Tambo, 1800 m, 1 skin & skull (Swedish Mus. Nat. Hist., Tamsitt & Valdivieso 1966); Quisquío, 1700 m, 1 skin & skull (Swedish Mus. Nat. Hist., Tamsitt & Valdivieso 1966). Published measurements (fa. 46.1, 47.2; max. toothrow l. 5.4, 5.6) (Tamsitt & Valdivieso 1966) agree with *Histiotus humboldti*.

A new species of Red Bat, genus *Lasiurus* Gray

In collections of the Field Museum of Natural History, I found a specimen (FMNH 93235) of a strikingly beautiful red bat representing an undescribed species. It was collected in Suriname in 1961 by Harry Beatty. A short time later, in the collections of the Universidad Central de Venezuela in Caracas. I discovered two more specimens of the same species that had been collected in Bolívar state in Venezuela in 1962 by Juhani Ojasti. None of these specimens has been mentioned in the literature, but recently a specimen from French Guiana has been reported by Brosset & Charles-Dominique (1990) and by Masson & Cosson (1992).

Lasiurus atratus, new species (Fig. 2, Table 2)

Synonymy.—

Lasiurus spec.? Brosset & Charles-Dominique, 1990:543.

Lasiurus castaneus Masson & Cosson, 1992:476 (not *Lasiurus castaneus* Handley, 1960).

Holotype.—FMNH 93235, adult male, skin and skull, collected 10 Feb 1961 by Harry A. Beatty.

Type locality.—Kaiserberg Airstrip, Zuid

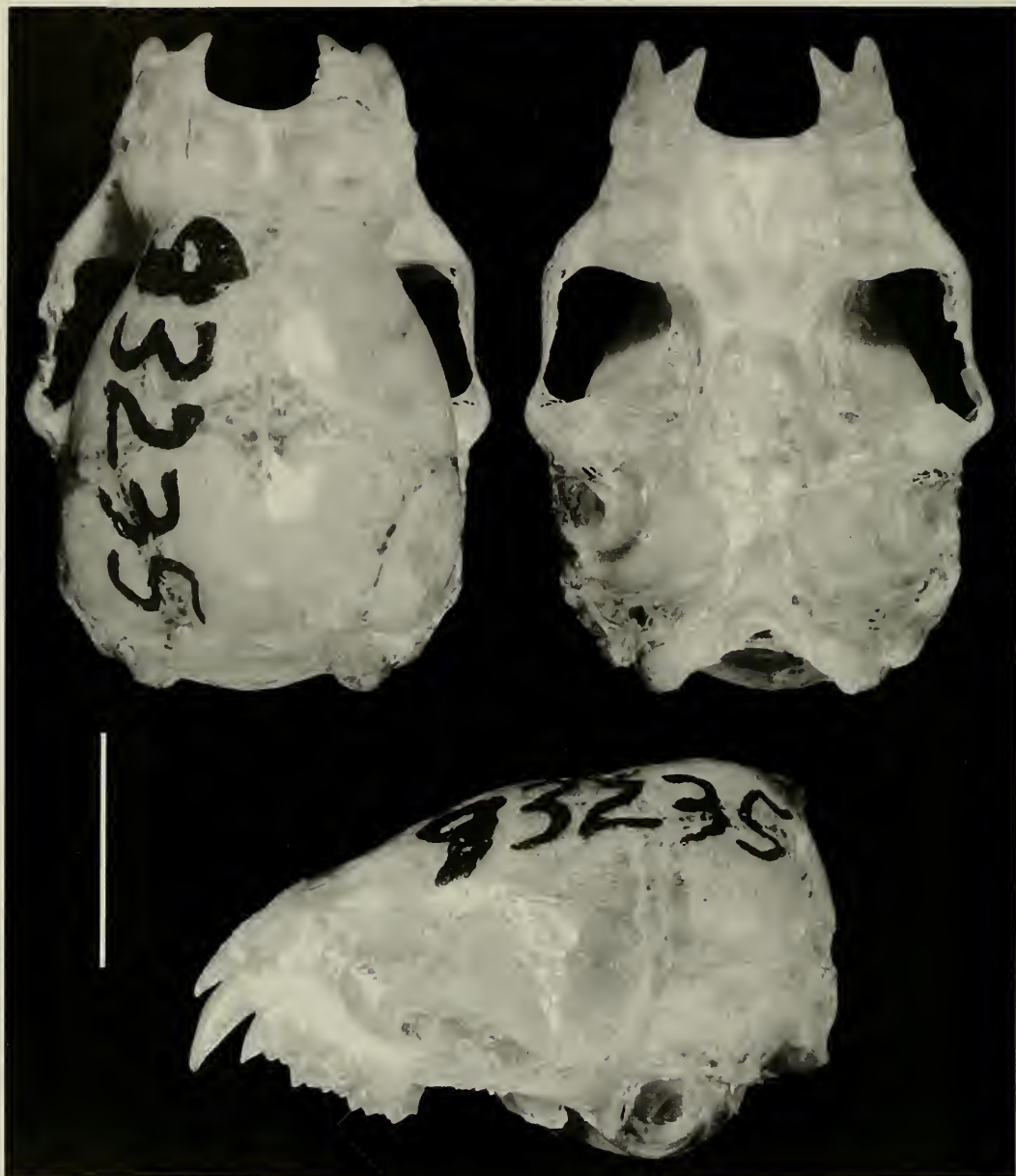


Fig. 2. Dorsal, ventral, and lateral views of the skull of the holotype of *Lasiurus atratus*, FMNH 93235, male, from Kaiserberg Airport, Zuid River, Suriname. Scott Steppan photograph. Scale 5.6:1.

River, Suriname. According to Stephens & Traylor (1985), this is a hilly region that had undisturbed lowland rainforest at the time of Beatty's visit. It is located about 03°07'N, 56°27'W, at an elevation of about 278 m.

Etymology.—The Latin *atratus*, dressed

in black, refers to the black wing membranes, which lack the ornate finger outlines that characterize the common red bat (*Lasiurus blossevillii*) of South and Central America.

Distribution.—Known only from Saül in southern French Guiana, from the type lo-

Table 2.—Measurements (in millimeters) of adult *Lasiurus atratus*.

	Venezuela						Suriname	Fr. Guiana
	El Dorado		Imataca				Kaiserberg	Saül
	UCV 5409 ♀	UCV 5410 ♀	Ochoa 2587 ♀	Ochoa 2588 ♀	Ochoa 3183 ♂	Ochoa 506 ♂	FMNH 93235* ♂	Masson & Cosson (1992) ♂
Total length	112	116	—	—	—	—	—	—
Tail vertebrae	53	57	—	—	—	—	—	—
Hind foot (dry)	10	10	11	11	11	11	10	—
Ear from notch	13	13	—	—	—	—	13	—
Forearm	46.9	46.8	47.6	46.0	45.9	45.1	46.1	45.3
Tibia	21.8	19.5	20.8	21.1	20.1	20.2	19.2	—
Calcar	14.1	13.6	16.5	16.5	13.9	14.9	12.7	—
Greatest length	13.2	13.0	12.9	12.7	12.5	12.6	13.0	12.9
Zygomatic breadth	9.9	10.2	9.9	9.6	9.3	10.0	9.4	9.6
Postorbital breadth	4.3	4.3	4.1	4.3	4.1	4.1	4.8	4.2
Braincase breadth	7.9	7.8	7.6	7.9	7.7	7.7	7.7	7.6
Braincase depth	6.4	6.2	6.1	6.1	6.0	6.2	6.5	6.5
Maxillary toothrow length	4.9	5.0	4.9	4.7	4.4	4.8	4.9	4.8
Postpalatal length	5.9	6.1	5.7	5.8	5.5	5.7	5.8	5.7
Maxillary breadth	6.5	6.8	6.8	6.5	6.1	6.8	6.4	6.6
Canine breadth	5.4	5.7	5.5	5.3	5.0	5.5	5.4	5.4

cality in southern Suriname, and from eastern Venezuela (Km. 55 on the highway southeast of El Dorado, and in the Imataca Forest, ca. 28 km E Tumeremo, Bolívar). Elevational range, 100 m in Bolívar to 278 m at Kaiserberg Airstrip. Probably *Lasiurus atratus* is a Guayanian endemic.

Ecology.—Localities in Suriname and Venezuela where this bat was collected in 1961 and 1962 were in undisturbed lowland rainforest, Tropical humid forest (bh-T) in the Holdridge classification (Ewel & Madriz 1968). The specimen from French Guiana was netted above a small stream on the border of heavy tropical humid forest and a cultivated clearing (Masson & Cosson 1992). Specimens taken in the Imataca Forest in Venezuela by José Ochoa, 1990–1992, and by Ochoa and Elisabeth Kalko in 1993, were netted over water-filled roadside ditches in secondary forest.

Diagnosis.—*Lasiurus atratus* is characterized by red dorsal coloration, black face, contrasting black and white chest, long black wings, medium size, small anteorbital pit, obsolete lachrymal process, slightly attenuated exoccipital process, well-devel-

oped mastoid process, small median anterior mesoterygoid process, obsolete basial pits, and relatively large molars.

Description.—A medium-sized *Lasiurus* (greatest length of skull 12.9–13.2) with long wings (forearm 45.3–46.9); dorsal coloration bright rufous red, without white or black hair tips; median buffy band of hairs much wider than black basal and red distal bands; face black; chin reddish; throat, chest, and belly contrasting black and white or brown and white (hairs white tipped, with successive black, pale or dark brown, and black bands); prominent white humeral spot; flanks buffy; wings black or blackish, lacking ornamental outlines around fingers and forearm; ears tan; interfemoral membrane furred to or near distal edge.

Skull (Fig. 2) with conventional shape of red bat group; rostrum broad (max. br. 6.1–6.8), but very short (max. toothrow l. 4.4–5.0) and shallow, sloping sharply downward anteriorly; facial profile straight; braincase large and globose, tilted up from palatal plane; sagittal crest low; lambdoidal crest weak and incomplete; mastoid process well-developed; exoccipital process trian-

gular, with a somewhat attenuated tip; zygoma weak, straight on dorsal edge; anteorbital pit small; lachrymal process and supraorbital ridge obsolete; palate short (max. toothrow l. 4.4–5.0) and wide (max. br. 6.1–6.8); anterior median process of mesopterygoid fossa short and wide; basial pits poorly developed.

Dental formula $1/3-1/1-2/2-3/3 \times 2 = 32$; anterior upper premolar tiny, wedged between lingual borders of canine and P4; molars moderately large; M3 with fully developed second commissure.

Comparisons.—Three species of red bats occur in the Guayana Region. They are graded in size. *Lasiurus egregius* Peters is large (fa. 50.0, gr. l. 15.7), *L. atratus* is medium (fa. 45.3–46.9, gr. l. 12.9–13.2), and *L. blossevillii* Lesson & Gernot is small (fa. 36–41, gr. l. 11.5–11.9). In the red phase (the only phase known in *L. egregius* and *L. atratus*) dorsal coloration is similar in all three—bright rufous red, with a wide buffy median band on hairs. The face is black in *L. atratus*; reddish or dusky in the other species. Coloration of the underparts varies widely in the three species—all red like the dorsum in *L. egregius*; speckled brown or gray and buff, moderately differentiated from the dorsum in *L. blossevillii*; sharply differentiated black and white in *L. atratus*. Wings are ornate, with fingers and forearm outlined with reddish in *L. blossevillii*; plain black in *L. atratus* and *L. egregius*. With respect to cranial features, *L. atratus* shares characters with *L. egregius* and *L. blossevillii*, but it differs from both of these species in having the anteorbital pit small, the lachrymal process obsolete, and the supraorbital process poorly developed.

Like *Lasiurus atratus*, its geographically remote relatives, *L. castaneus* of Central America and *L. varius* of Chile, have black unornamented wings, but otherwise they are quite different from it. Both have shorter wings and strongly developed lachrymal and supraorbital processes and anteorbital pit. *L. castaneus* has totally different coloration—blackish underparts, dark dorsum,

and narrow median band on dorsal hairs, as well as more elevated braincase, well-developed basial pits, and much reduced M3. Underparts of *L. varius* are uniform orange-buff, and it has much more robust molars; cranial characters relate it more closely to *L. blossevillii*.

Specimens examined.—Suriname: Nickarie: Kaiserberg Airstrip, Zuid River. [ca. 278 m], 1 skin and skull (FMNH). Venezuela: Bolívar: Km 55 on highway south of El Dorado, 100 m, 2 skins & skulls (UCV); Reserva Forestal Imataca (Unit 5), ca. 28 km E Tumeremo, 140–180 m, 1 skin & skull, 1 skin, skull & skeleton, 2 alcoholics with skulls, 7 alcoholics (collection of J. Ochoa), 2 alcoholics with skulls (USNM). Total 16.

References to other specimens.—French Guiana: 4 km N Saül, 03°40'N, 53°13'W (Masson & Cosson 1992). As described and measured by Masson and Cosson (1992), this specimen can be only *Lasiurus atratus* (see Table 2).

Acknowledgments

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